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10/594,107

09/25/2006

Estill Thone Hall JR.

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EXAMINER

HOWARD, RYAN D

ART UNIT

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2851

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | | |
|------------------------------|--------------------------------------|---|--|
| Office Action Summary | Application No. 10/594,107 | Applicant(s) HALL, ESTILL THONE | |
| | Examiner RYAN HOWARD | Art Unit 2851 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 9/25/06.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/25/2006</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-2, 4, 11-12, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon et al. (US 2003/0142274 A1) in view of Wada et al. (US Patent 6,633,436 B2).

Regarding claims 1 and 10, Gibbon teaches a first imager configured to modulate a light band on a pixel-by-pixel basis proportional to gray scale values provided for each pixel of the image to produce a first output matrix (16, figure 2); a second imager positioned and configured to receive the first output matrix of modulated pixels of light and modulate the individual modulated pixels of light from said first imager on a pixel-by-pixel basis (20, figure 2) proportional to a second gray scale value provided for each pixel of said image to produce a second output matrix (paragraph 0036); a relay lens system for projecting the first output matrix from the first imager onto the second imager (18, figure 2); and a projection lens system for projecting the second output matrix onto a screen (paragraph 0038). Gibbon does not teach the first imager, the second imager, the relay lens system, and the projection lens system are configured to provide a speed of at least about f/2.0. Wada teaches a projector using speed of f/2.0 (column 2 lines 30-32). Therefore, it would have been obvious to a person having ordinary skill in the

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art at the time the invention was made to set the speed of the projection system of Gibbon to at least about $f/2.0$ as taught by Wada because a projection system with a speed of $f/2.0$ has a brightness sufficient to maintain marketability (column 2 lines 30-32).

Regarding claim 2, Gibbon further teaches the relay lens system is symmetrical (18, figure 2).

Regarding claims 4 and 14, Gibbon further teaches focusing the light from one micro-mirror (first pixel) on to a second micro-mirror (second pixel) on the corresponding DMD (paragraph 0038), a one to one correspondence. Gibbon does not specifically disclose that the relay lens system projects greater than 60 percent of the energy from a particular pixel within a square having a 9 micron half-width. One of ordinary skill in the art at the time the invention was made, would appreciate that the individual mirrors of the DMD are all around the size of a 9 micron half-width, and because of the one to one correspondence between pixels of the different micro-mirrors one of ordinary skill in the art would have focused 60 percent of the energy or more within a 9 micron half-width in order to prevent the information of the first pixel from leaking onto pixels adjacent to the second pixel in the second micro-mirror array.

Regarding claim 11, Gibbon further teaches the contrast ratio of the image projection system is greater than the contrast ratio of either the first imager or the second imager, individually (paragraphs 0036-0037).

Regarding claim 12, Gibbon further teaches the relay lens system is symmetrical (18, figure 2).

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3. Claims 3 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon in view of Wada as applied to claims 2, and 12 above, and further in view of Lawson et al. (US 4,561,730).

Regarding claims 3 and 13, Gibbon in view of Wada does not teach a relay lens system comprising a system stop having two acromatic lenses adjacent to the system stop and an acrylic asymmetric lens at the beginning and end of the relay lens system. Lawson teaches a relay lens system having a system stop (82, figure 3), two acromatic lenses adjacent to the system stop (II, III, figure 3), and an acrylic asymmetric lens at the beginning and the end of the relay system (I, IV, figure 3). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made combine the projector system of Gibbon in view of Wada with the lens system of Lawson because the lens system of Lawson corrects for chromatic and spherical aberrations thereby improving image quality (column 3 lines 3-9).

4. Claims 5-7 and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon in view of Wada as applied to claims 1, and 11 above, and further in view of Kreitzer et al. (US 6,195,209 B1).

Regarding claims 5 and 15, Gibbon in view of Wada does not teach a projection lens sytem comprising sequentially, an acrylic asymmetric lens, first and second acromatic lenses, a system stop, a third acromatic lens and a second acrylic asymmetric lens. Kreitzer teaches the projection lens system comprises, sequentially, an acrylic asymmetric lens (column 7 lines 3-6), a first and second acromatic lenses (column 7 lines 27-37), a system stop (AS, figures 1-9), a third acromatic lens (column 7

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lines 15-17), and a second asymmetric lens (column 7 lines 1-3). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the projection system of Gibbon in view of Wada with the projector lens of Kreitzer because the projector lens of Kreitzer corrects for aberrations thereby improving image quality (column 4 lines 16-25).

Regarding claims 6 and 16, Kreitzer further teaches the first second and third acromatic lenses each have at least one asymmetric surface (table 6; column 41). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the projection system of Gibbon in view of Wada with the projector lens of Kreitzer because the projector lens of Kreitzer corrects for aberrations thereby improving image quality (column 4 lines 16-25).

Regarding claim 7 and 17, Kreitzer further teaches the first and second acromatic lenses each have three asymmetric surfaces (table 6; column 41). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to combine the projection system of Gibbon in view of Wada with the projector lens of Kreitzer because the projector lens of Kreitzer corrects for aberrations thereby improving image quality (column 4 lines 16-25).

5. Claims 8, 9, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gibbon in view of Wada as applied to claims 1, and 11 above, and further in view of Seo et al. (US 2002/0154273 A1).

Regarding claims 8 and 18, Gibbon in view of Wada does not teach the first and second imagers are LCOS imagers. Seo teaches the use of LCOS imagers as light

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modulators (60, figure 1). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to replace the micro-mirror devices of Gibbon with the LCOS imaging of Seo because the LCOS imaging is smaller and has a higher resolution (paragraph 0006).

Regarding claim 9, Seo further teaches at least one polarizing beam splitter, wherein said first imagers is an LCOS imager and said polarizing beam splitter provides polarized light to said first imager (70, figure 1). Therefore it would have been obvious to a person having ordinary skill in the art at the time the invention was made to replace the micro-mirror devices of Gibbon with the LCOS imaging of Seo because the LCOS imaging is smaller and has a higher resolution (paragraph 0006).

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Moskovich (US 2002/0141072 A1) teaches that the individual mirror elements of a DMD are typically 17 microns as well as a projection lens assembly with three chromatic correcting lenses and a two aspheric lenses.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to RYAN HOWARD whose telephone number is (571)270-5358. The examiner can normally be reached on Monday-Friday 7:30-5:00, First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diane Lee can be reached on (571)272-2399. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/William C. Dowling/
Primary Examiner, Art Unit 2851

/Ryan Howard/
Examiner, Art Unit 2851
10/09/2008